INDUSTRY RESEARCH & INNOVATION PROJECTS

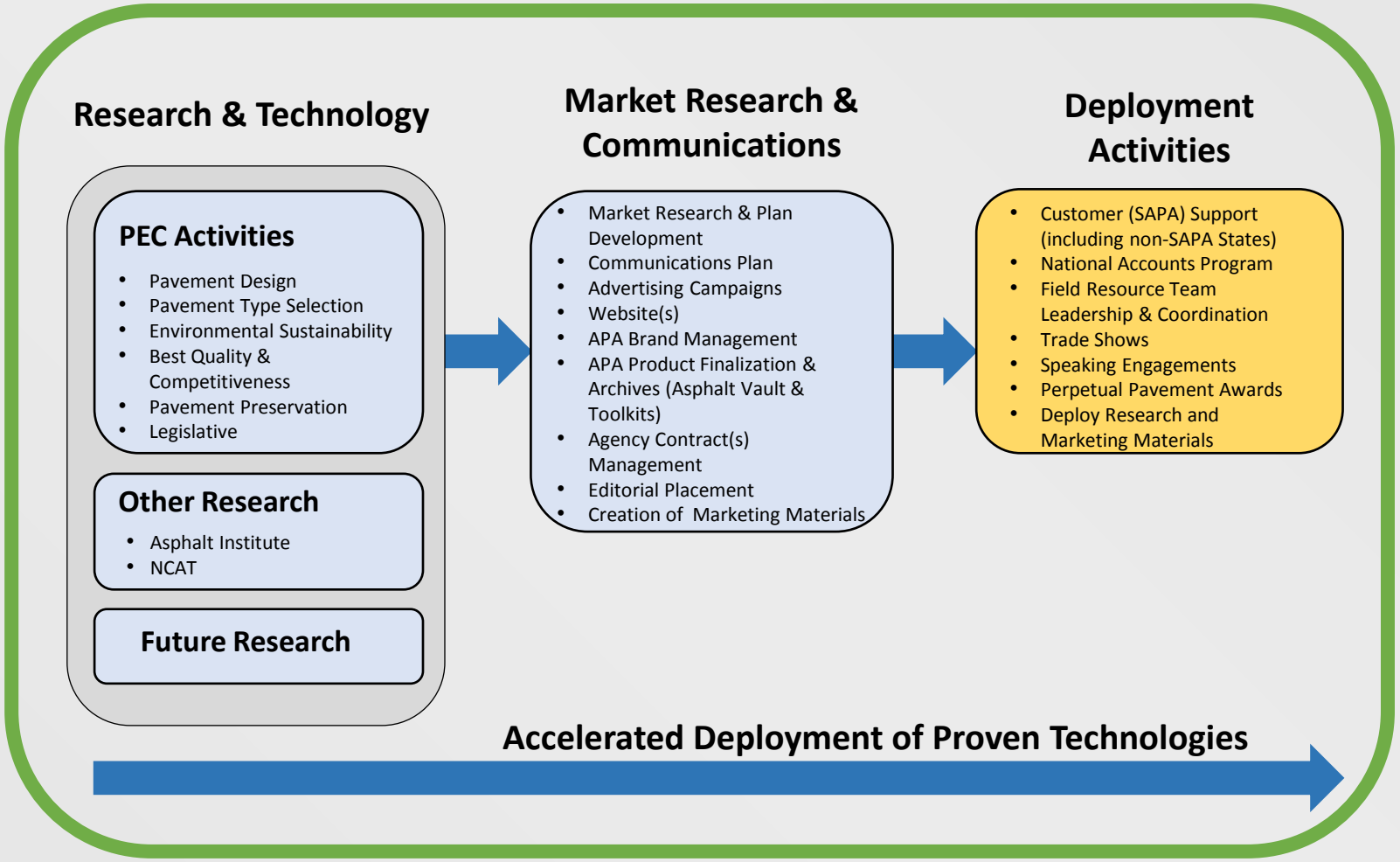
AUDREY COPELAND

27th Annual Fall Asphalt Conference
Richmond, Virginia
October 7th, 2014

NATIONAL ASPHALT PAVEMENT ASSOCIATION


Let’s Talk About…
What our customers want
Research projects and implementation
A partnership for innovation in asphalt pavements

Built Upon Science



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A Survey of Pavement Officials And the Driving Public

What Do Our Customers Want?

APA ASPHALT PAVEMENT ALLIANCE

The APA is a partnership of the Asphalt Institute, National Asphalt Pavement Association and the State Asphalt Pavement Associations.

Edelman Berland

Survey Participants

SURVEY	WHO
Driver Preference Survey	US Drivers, 18+
	Regional Oversamples
	Trucker Oversample
Driver Survey	US Drivers, 18+ who drive 50+ miles per week
In-Depth Interviews DOT's, Public Works	Appointed Officials, Engineers, Architects, Developers, Owners and Concessionaries, and Other Key Stakeholders
Survey DOT's, Public Works	

WHAT MATTERS TO DRIVERS?

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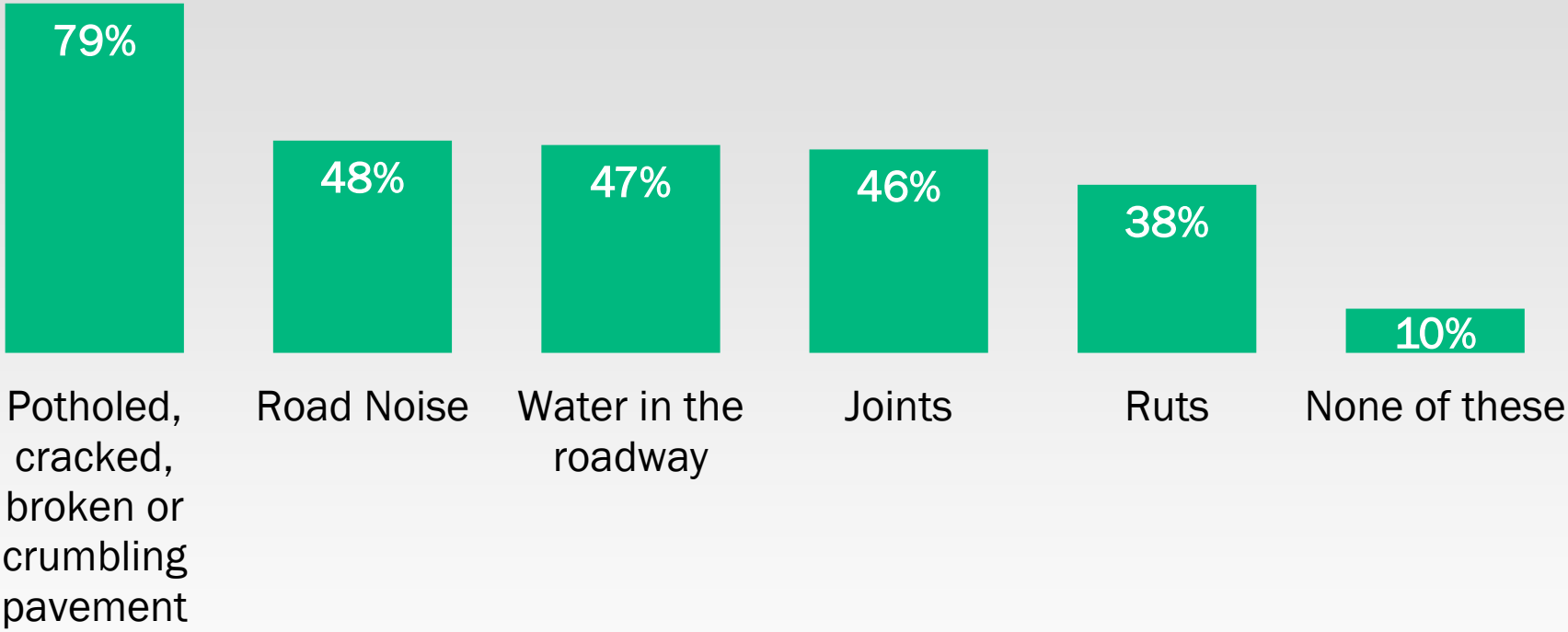
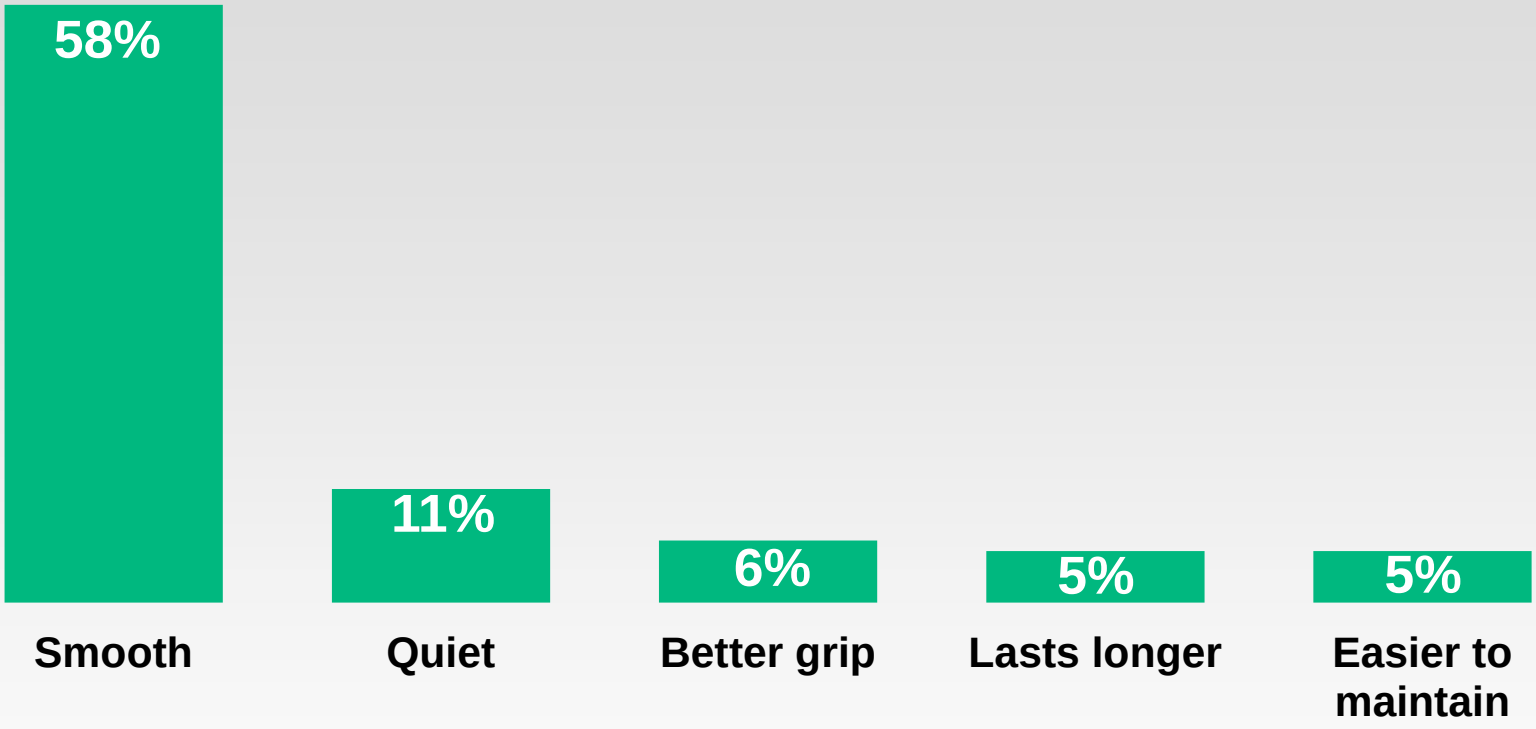
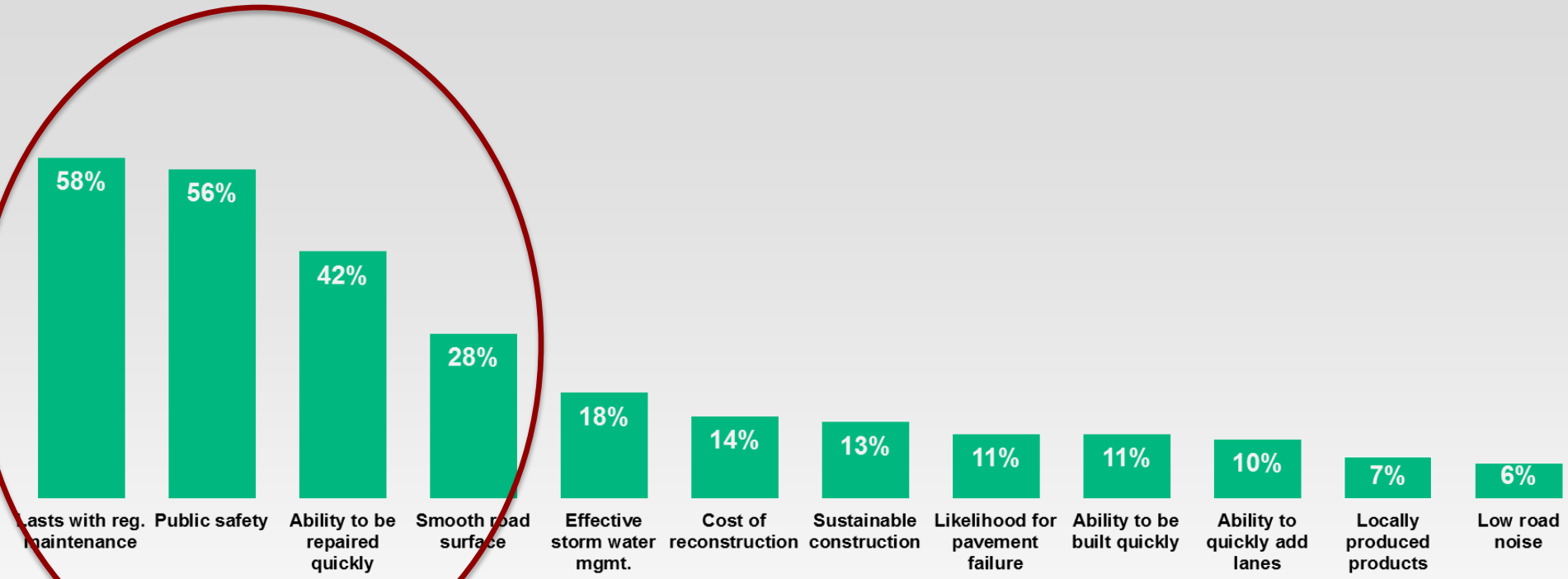
Common Roadway Issues Experienced in the Past Year



Drivers – Satisfaction Indicators



Priorities When Building/Rebuilding Roads



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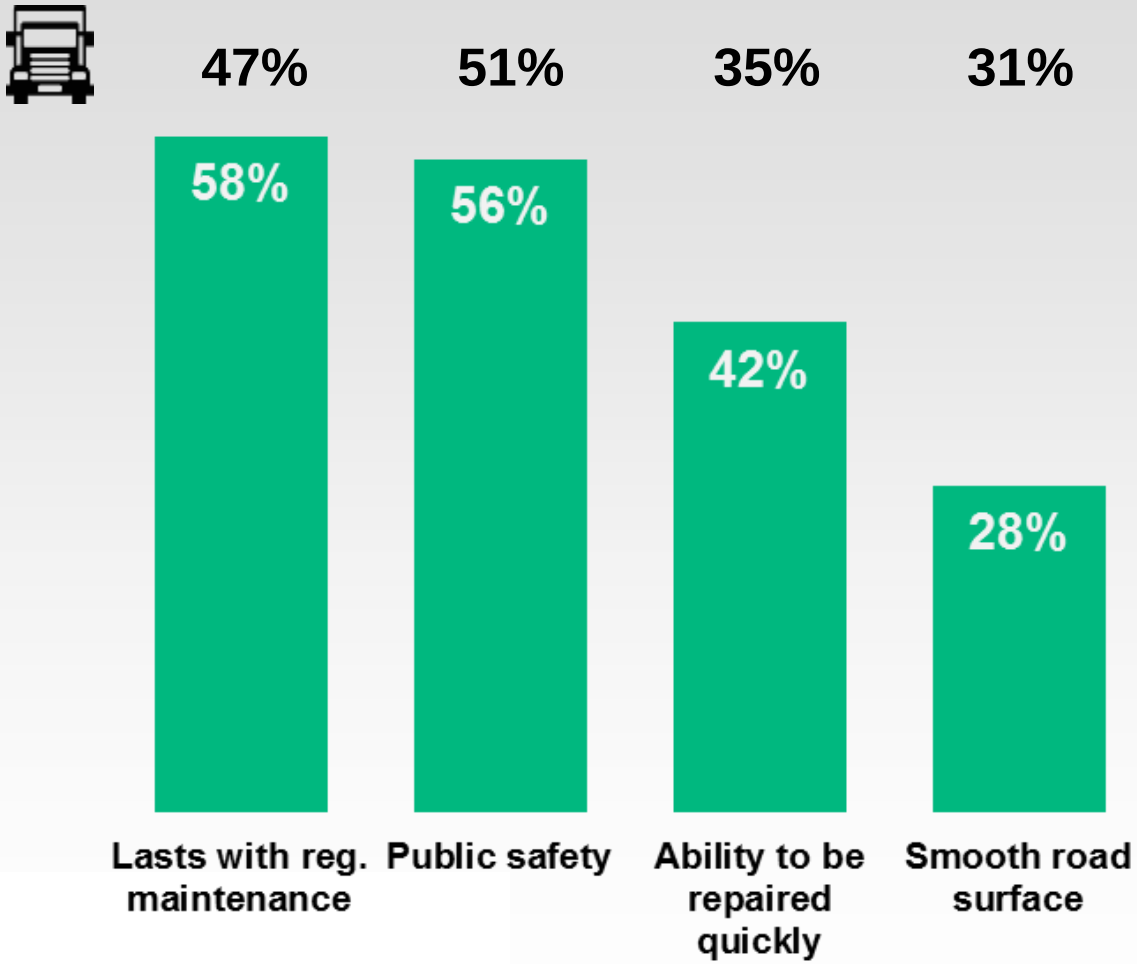
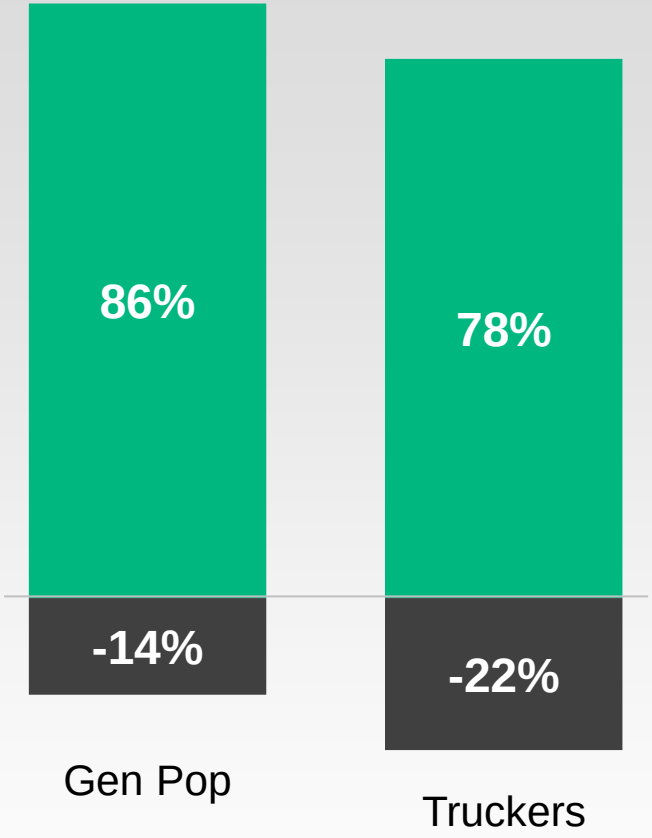


Roadway Spending Priorities



1. PERFORMING MAINTENANCE & REPAIRS

Gen Pop: 79% most important
Truckers: 68% most important

2. INCREASING CAPACITY

Gen Pop: 63% second most important
Truckers: 56% second most important

3. BUILDING NEW ROADS

Gen Pop: 68% least important
Truckers: 56% least important

WHAT MATTERS TO DECISION MAKERS?

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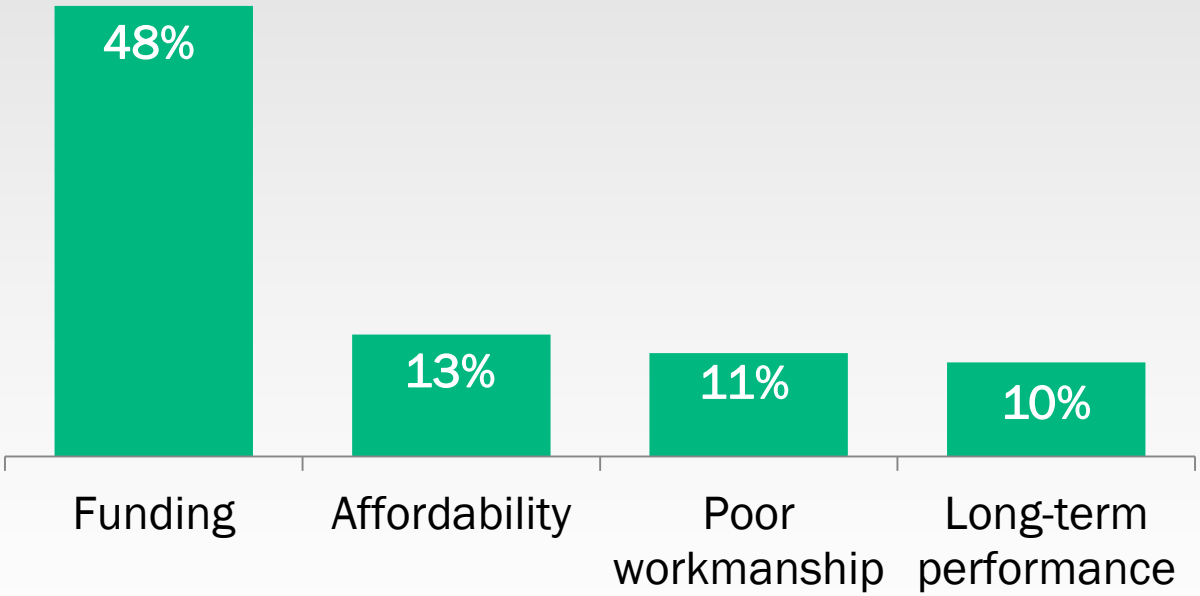
Key Findings – In-Depth Interviews

- Shrinking infrastructure funding.
- Pavement innovation is key to reducing costs.
- Speed of construction was a primary asphalt differentiator.
- Pavement decision makers have positive perceptions of asphalt pavement industry.
- Agencies take into account driver and stakeholder opinions.

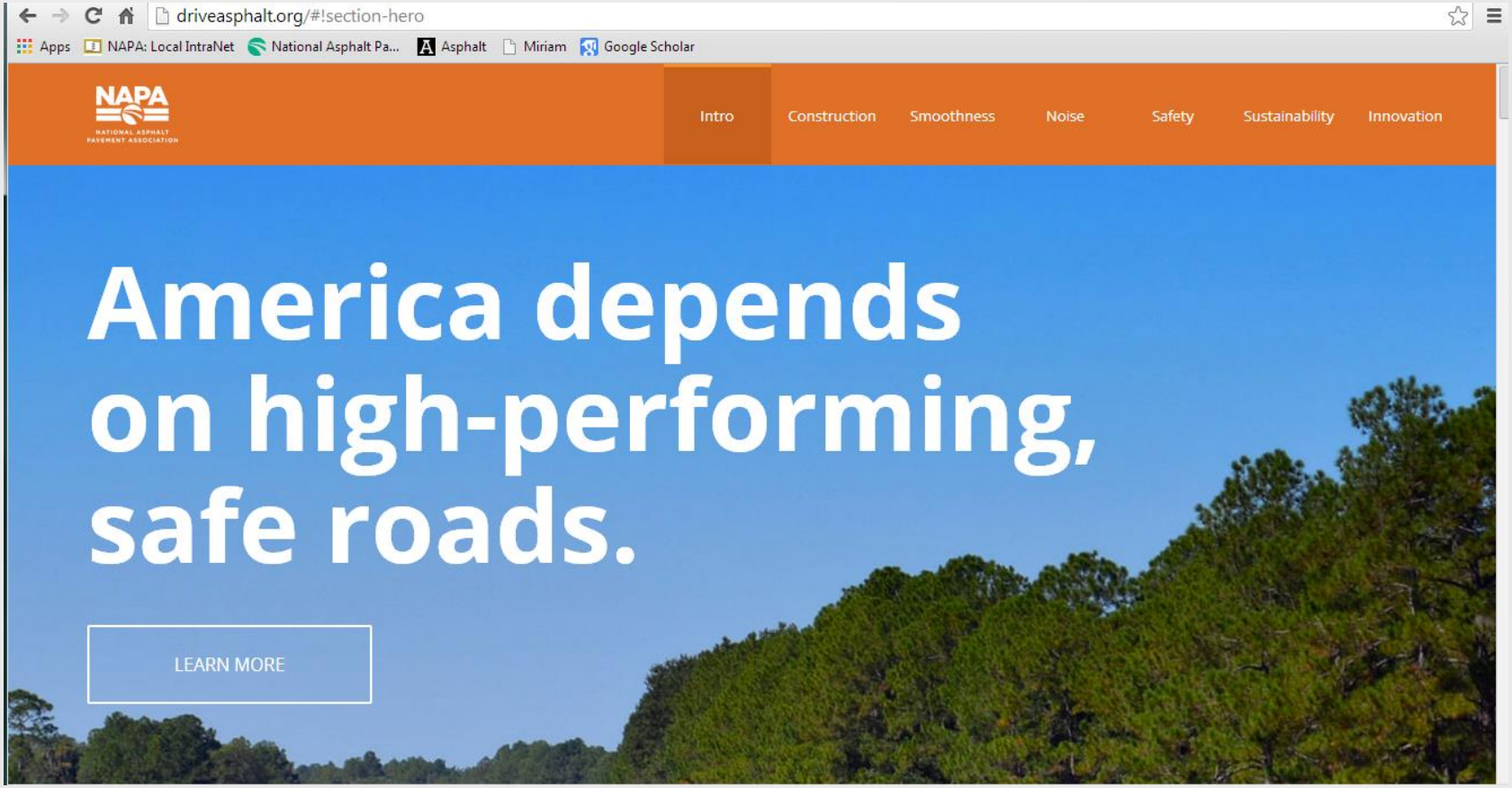
Challenges to Meeting Priorities



Our Customers Want

- Durable, Long-Lasting pavements.
- Reduced Costs Through Pavement Innovations.
- A Smooth, Quiet and Safe Pavement that can be Maintained.
- To Minimize Construction-Related Delays.
- Funding for Maintenance and Capacity Expansion.

Driveasphalt.org



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SAPA State Asphalt Pavement Associations

Asphalt Industry's Investment

Six NAPA–SAPA Task Groups

- Best Quality & Competitiveness
- Environmental Sustainability
- Legislative
- Pavement Design
- Pavement Preservation
- Pavement Type Selection

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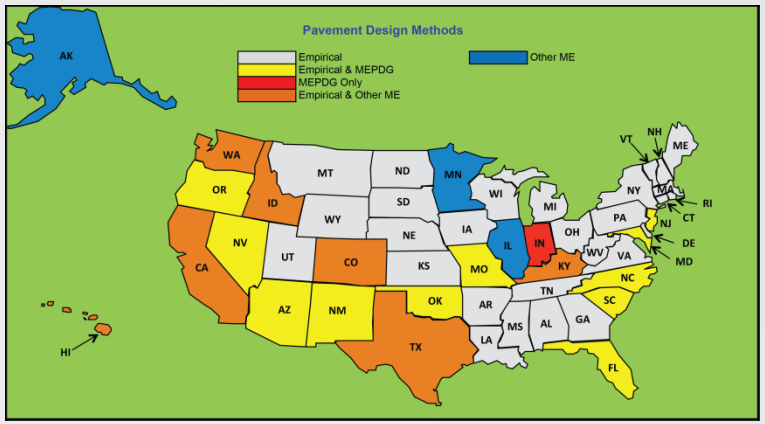
LCCA Issues in Washington

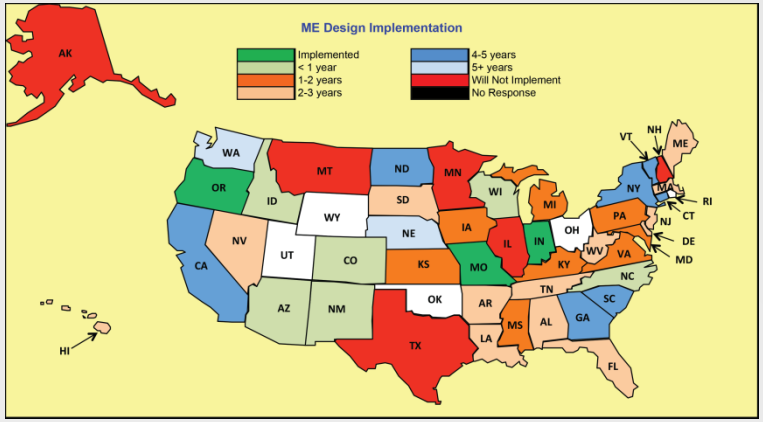
- MAP-21
  - Mandate LCCA, Alternative Bid, and MEPDG
- Financial Services Appropriations Bill
  - Mandate Material-Specific Discount Rates
- Water Resources Development Act
  - Mandate LCCA on Corps Projects
- MAP-21 Reauthorization
  - LCCA on all Federal-Aid Highway Projects
- Ready Mixed Concrete Check-Off

Legislative

Pavement Type Selection & Pavement Design Deliverables

- Optimized Pavement Design & Materials Selection
- Determining Service Life based on Comparable IRI Values
- www.ncat.us





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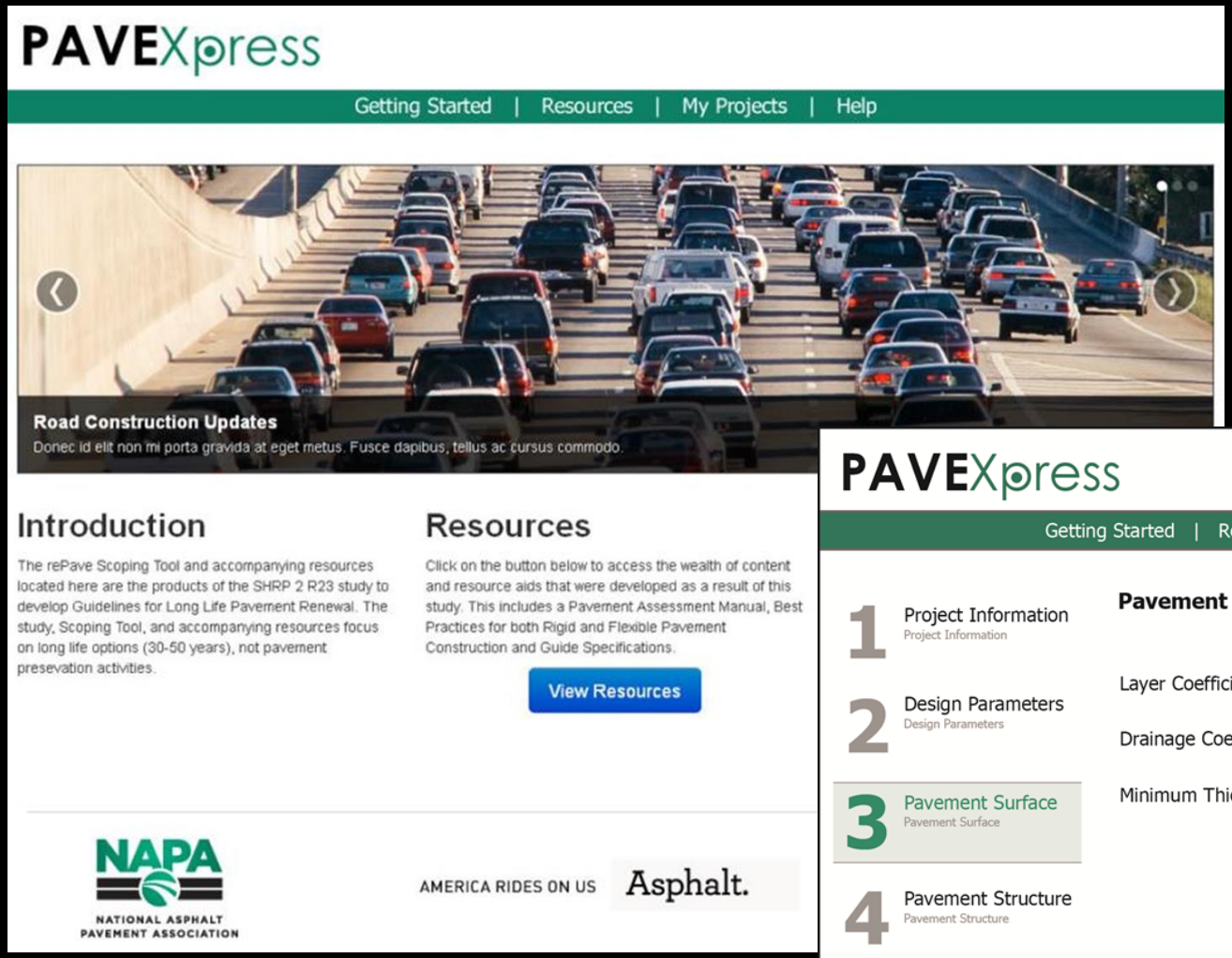
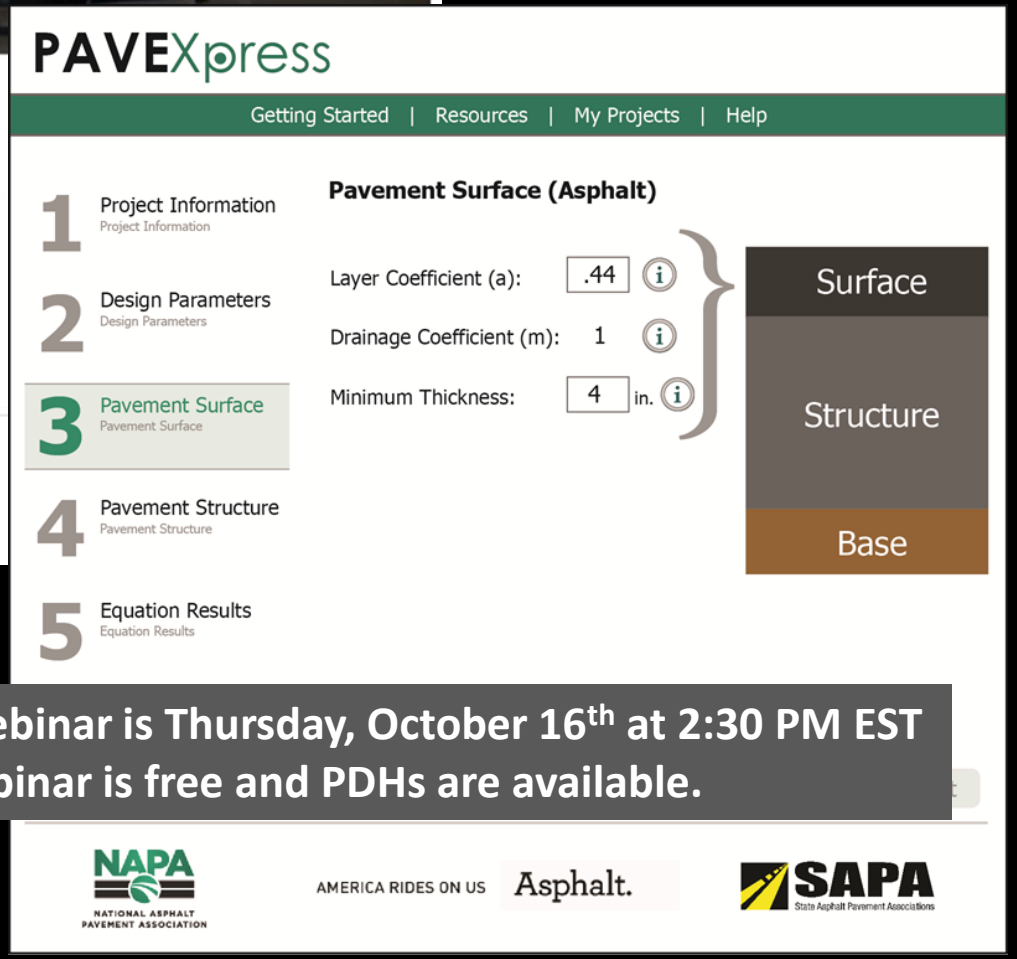
Pavement Design

Pavement Type Selection

SAPA State Asphalt Pavement Associations



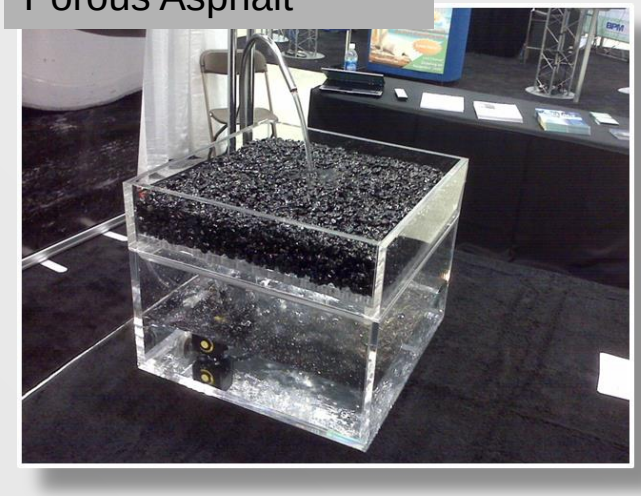


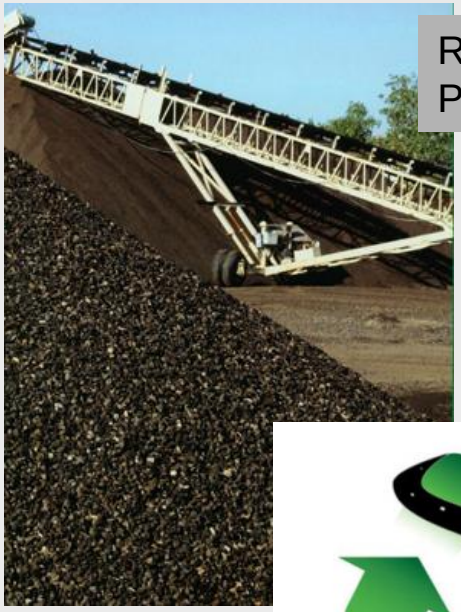
Pavement Design

Next webinar is Thursday, October 16th at 2:30 PM EST
The webinar is free and PDHs are available.

Sustainable Asphalt Technologies

Porous Asphalt





Reclaimed Asphalt Pavement (RAP)

Ground Tire Rubber (GTR)

Warm Mix Asphalt (WMA)

Perpetual Asphalt Pavement

Recycled Asphalt Shingles (RAS)

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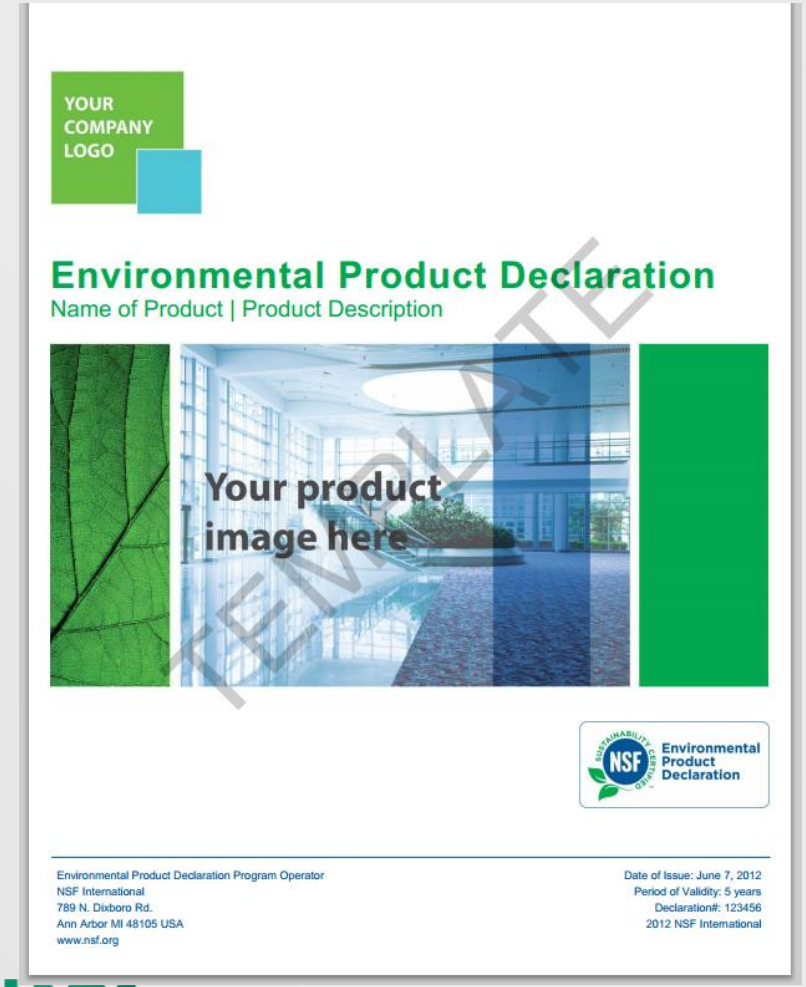
Environmental Product Declarations



Environmental Facts

Functional unit: 1 metric ton of asphalt concrete

Primary Energy Demand [MJ]	$3.9x10^3$
Renewable [MJ]	*$3.9x10^3$*
Non-Renewable [MJ]	*$3.5x10^2$*
Global Warming Potential [kg CO_2-eq]	79
Acidification Potential [kg SO_2-eq]	0.23
Eutrophication Potential [kg N-eq]	0.012
Ozone Depletion Potential [kg CFC-11-eq]	$7.3x10^{-9}$
Smog Potential [kg O_3-eq]	4.4

Boundaries: Cradle-to-Gate
Company: XYZ Asphalt
RAP: 10%

Source: PE International, Values are for illustration purposes only.

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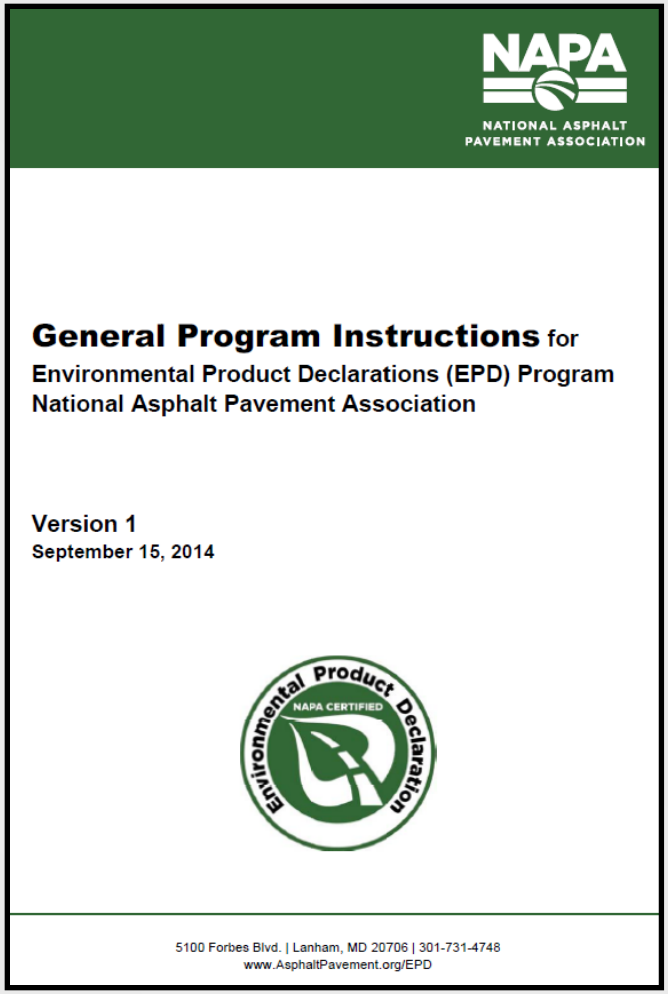
Asphalt Industry EPD Program

Learn more about:

- Program Goals and Objectives
- Product Category Rules
- PCRs Under Development by NAPA/SAPAs
  - Asphalt Mixtures



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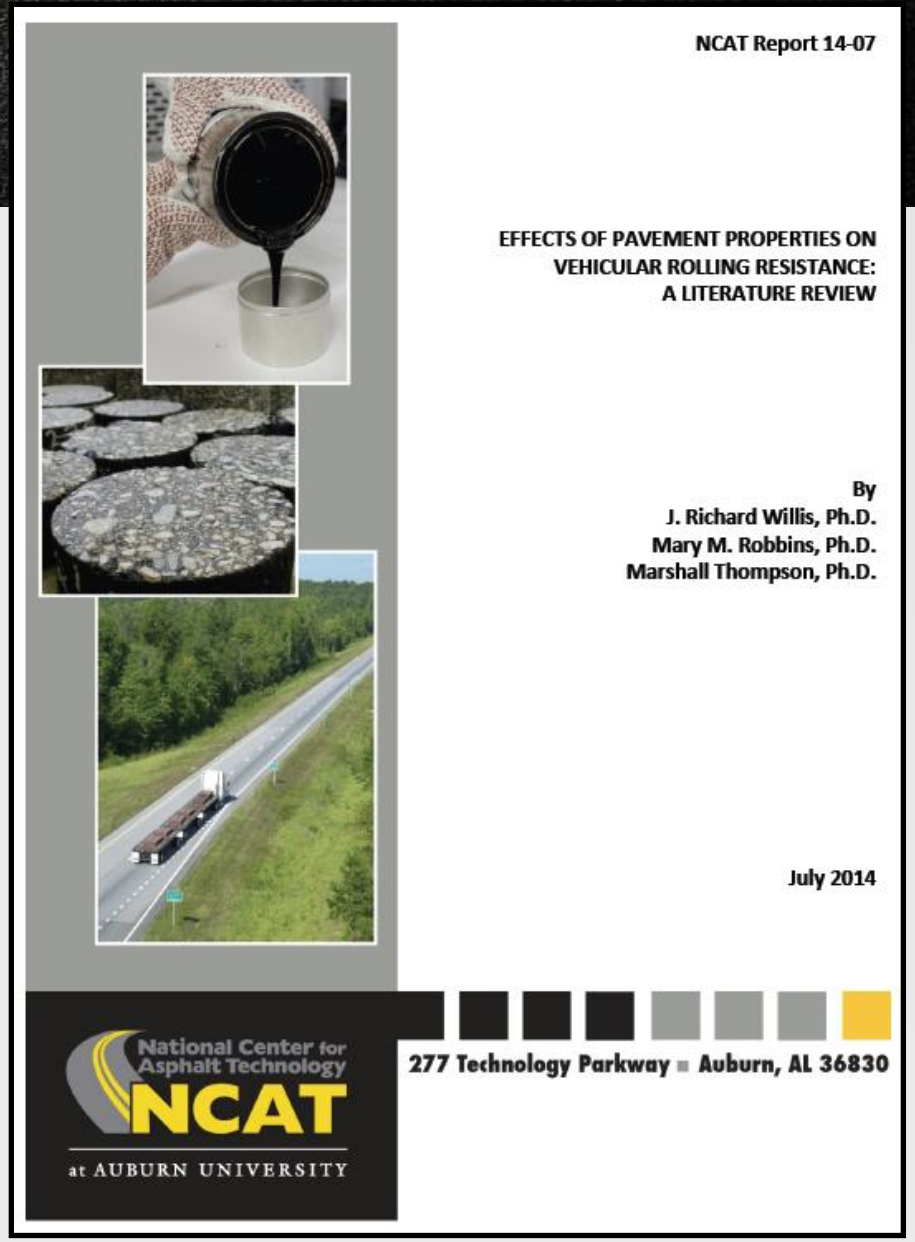
PVI & MIT Review

- Coming soon: Review of *Model-Based Pavement-Vehicle Interaction Simulation for Life Cycle Assessment of Pavements* from a Pavement Design Perspective

- NAPA Webinar: Where the Rubber Hits the Road: PVI Re-examined



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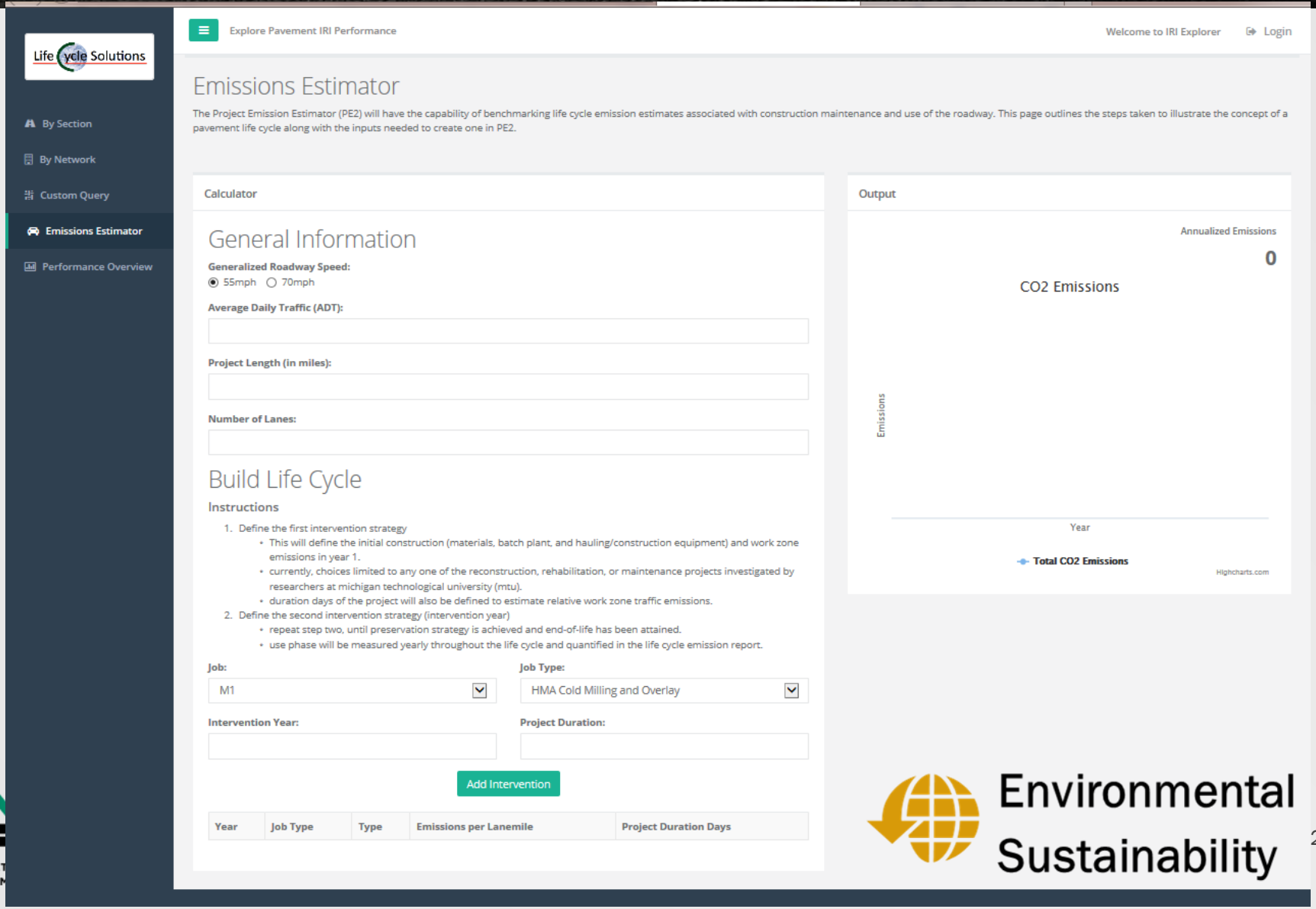
Environmental Sustainability

SAPA State Asphalt Pavement Associations

IRI Database for Smoothness & Emissions



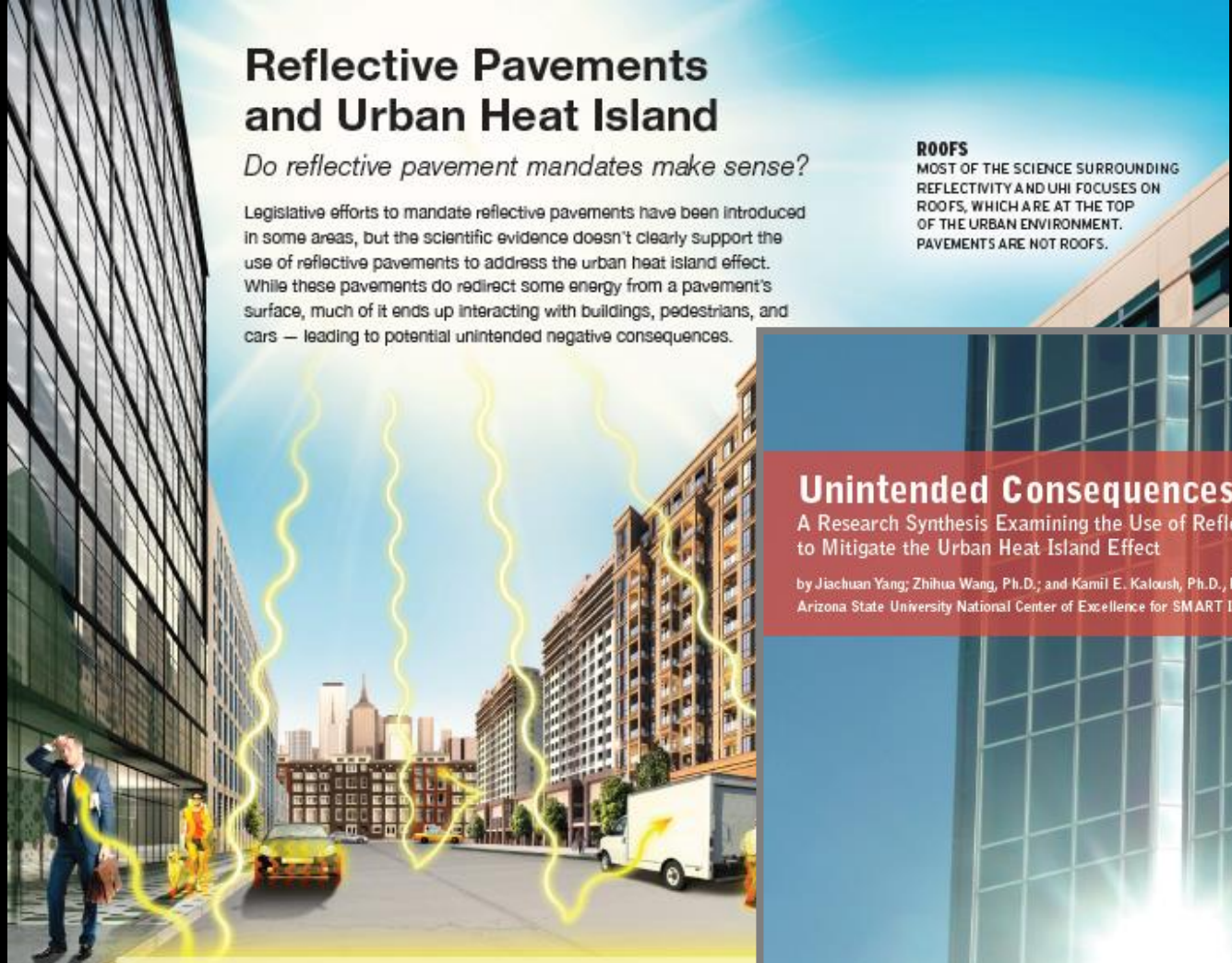
Environmental Sustainability

Reflective Pavements and Urban Heat Island

Do reflective pavement mandates make sense?

Legislative efforts to mandate reflective pavements have been introduced in some areas, but the scientific evidence doesn't clearly support the use of reflective pavements to address the urban heat island effect. While these pavements do redirect some energy from a pavement's surface, much of it ends up interacting with buildings, pedestrians, and cars — leading to potential unintended negative consequences.

ROOFS
MOST OF THE SCIENCE SURROUNDING REFLECTIVITY AND UHI FOCUSES ON ROOFS, WHICH ARE AT THE TOP OF THE URBAN ENVIRONMENT. PAVEMENTS ARE NOT ROOFS.



REFLECTIVE CONCRETE PAVEMENTS MIGHT NOT WORK AS CLAIMED TO

SURFACE TEMPS
DIFFERENCES IN SURFACE TEMPERATURES HAVE MINIMAL BEARING

SUMMER
REFLECTED RADIATION CAN INCREASE COOLING LOADS FOR SURROUNDING BUILDINGS IN THE SUMMER.

WINTER
LIGHT-COLORED PA
REQUIRE MORE DEI
CHEMICALS IN WINT
CONTROL SNOW A

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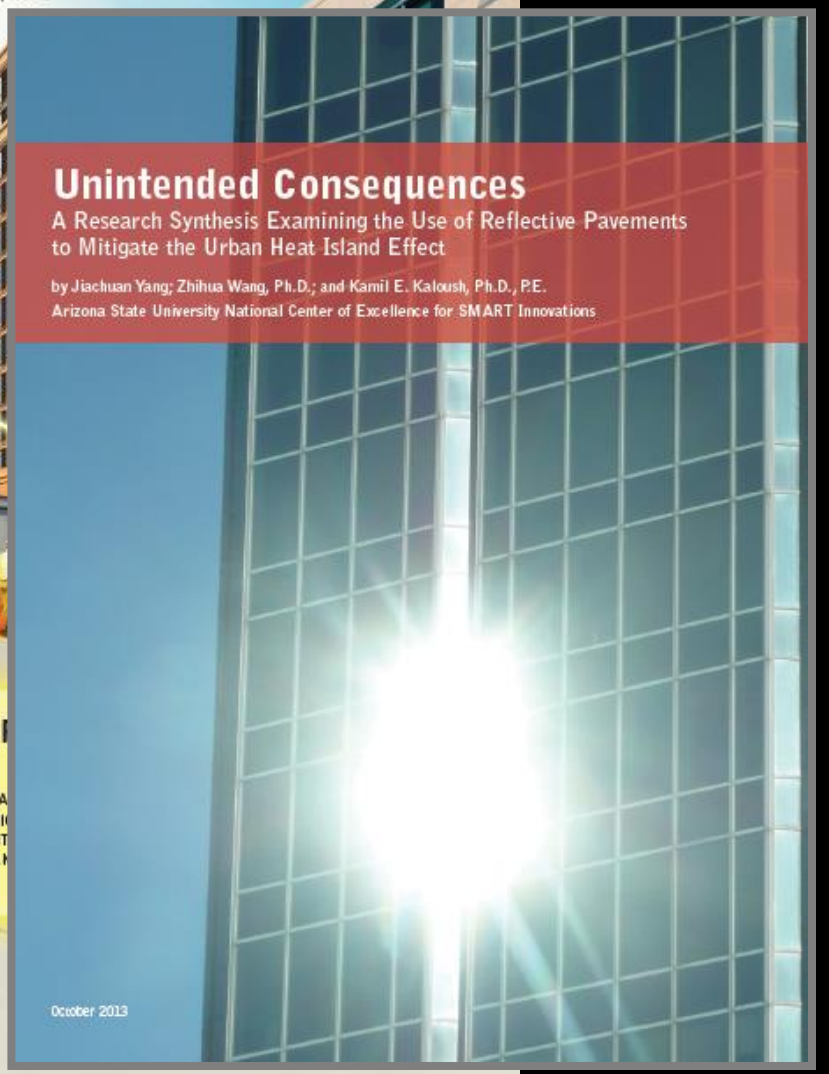
Unintended Consequences

A Research Synthesis Examining the Use of Reflective Pavements to Mitigate the Urban Heat Island Effect

by Jiachuan Yang; Zhihua Wang, Ph.D.; and Kamil E. Kaloush, Ph.D., P.E.
Arizona State University National Center of Excellence for SMART Innovations



October 2013

Environmental Sustainability

Best Quality and Competitiveness Deliverables

- High Binder Replacement for Recycled Materials
  - Draft Synthesis
  - Webinar: Improved Sustainability & Performance with High RAP and RAS Usage

- Education and Training Program
  - LCCA and Innovative Technologies

THINLAY
SAFE. SMOOTH. DURABLE.

POSITION PAPER

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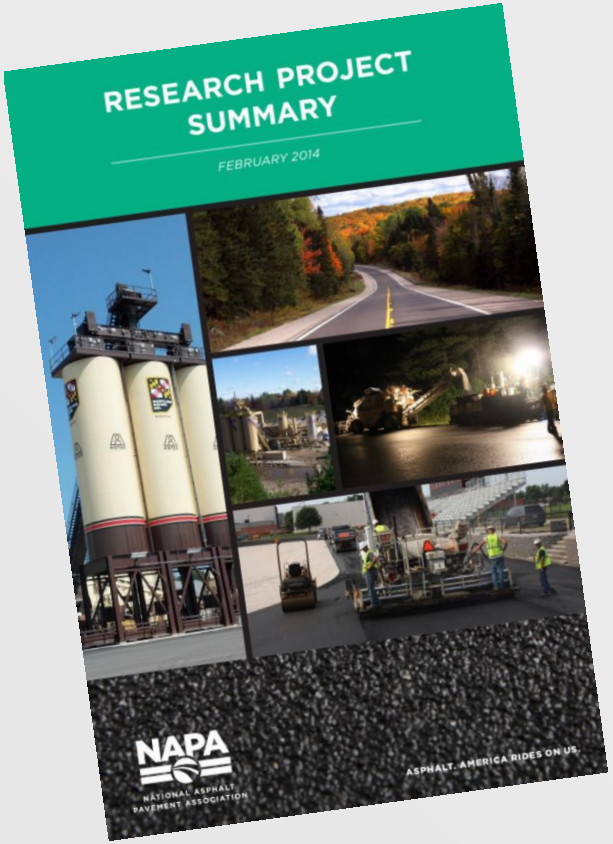
5100 Forbes Boulevard, Lanham, MD USA 20706-4407
TF: 888.468.6499 PH: 301.731.4748 FX: 301.731.4621
www.asphaltpavement.org

Thinlays: The Pavement Preservation Tool of Choice

NAPA Position on Thin Asphalt Overlays for Pavement Preservation

http://www.asphaltpavement.org/ThinIsIn

PEC Projects Summary



Other PEC Projects

- Develop Thinlays with High Recycled Content
- Asphalt's Speed of Construction for Cost Effectiveness

Download a copy: http://goaspha.lt/1grtLlj

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State Asphalt Pavement Associations

FHWA/Industry Partnership

- $2.5 million Cooperative Agreement for the *Advancement of Innovative Asphalt Technologies*
- Partnership provides a mechanism to advance implementation of innovations
- Agreement is for 5 years, FY 2014–2018

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U.S. Department of Transportation
Federal Highway Administration

Deliverables

- FY2014–15 Deliverables Include
  - Recycled Materials & WMA Survey (2013)
  - RAP Management Best Practices
  - Recycled Tire Rubber Best Practices
  - High Binder Replacement Mixtures Synthesis
  - Pavement Economics & LCCA Webinar

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National Center for Asphalt Technology NCAT AUBURN UNIVERSITY
Texas A&M Transportation Institute
ADVANCED ASPHALT TECHNOLOGIES, LLC Engineering Services for the Asphalt Industry
SAPA State Asphalt Pavement Associations

NAPA Webinar TALKS

COMING UP!

PaveXpress: A Simplified, Online Pavement Design Tool
October 16th at 2:30 PM EDT

Available Online:

- LCCA for Pavements
- What, How, and Why of EPDs
- Porous Asphalt Pavement
- Thinlays for Pavement Preservation
- Sustainability 101: The What, Why, And How of Sustainability for the Asphalt Industry

JUST ADDED:
Tour the New Orleans Lager & Ale Brewing Co.
- a Sustainable Brewery!

THANK YOU

asphaltpavement.org

@NAPATweets

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@AudreyRCopeland

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What do we value?

- Decision Makers
  - Cost over life-cycle
  - Performance
  - Long-life – quality of ride over life
- Driver Perception Survey
  - Smooth, Safe, Quiet
  - Service
    - Well-maintained
    - Delays & construction timing
  - Quality of drive

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2013 Industry Survey Results - Preliminary

- Total Estimated Tonnage: 351 million
- Tons of RAP Used in Asphalt Mixtures: 68 million
- National Average RAP Use: 20%
- Tons of RAS Used in Asphalt Mixtures: 2.3 million
- Tons of WMA: 106 million
  - Chemical Additive: 12%
  - Plant Foaming: 87%

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THE BIG THINGS - NOW

- PAVEMENT TYPE SELECTION
- PAVEMENT DESIGN & MATERIALS
- SUSTAINABLE PAVEMENTS
- PRESERVATION

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